

WHAT IS CLAIMED IS:

1. A glass package comprising:
a first glass plate;
5 a second glass plate; and
a frit made from glass that was doped with at least one transition metal and a coefficient of thermal expansion (CTE) lowering filler, wherein said frit was heated by a irradiation source in a manner that caused said frit to melt and form a hermetic seal which connects said first
10 glass plate to said second glass plate.
2. The glass package of Claim 1, wherein each of said first and second glass plates absorbs less light from said irradiation source when compared to light absorbed by
15 said frit from said irradiation source.
3. The glass package of Claim 1, wherein said frit has a softening temperature that is lower than the softening temperatures of said first and second glass
20 plates.
4. The glass package of Claim 1, wherein said frit has a CTE that substantially matches the CTEs of said first
25 and second glass plates.

5. The glass package of Claim 1, wherein said filler is an inversion filler.

6. The glass package of Claim 1, wherein said filler is an additive filler.

7. The glass package of Claim 1, wherein said frit is a low temperature glass frit containing one or more absorbing ions chosen from the group including iron, copper, vanadium, and neodymium.

8. The glass package of Claim 1, wherein said frit excluding the CTE lowering filler has the following composition:

15	K ₂ O	(0-10 mole %)
	Fe ₂ O ₃	(0-20 mole %)
	Sb ₂ O ₃	(0-40 mole %)
	P ₂ O ₅	(20-40 mole %)
	V ₂ O ₅	(30-60 mole %)
20	TiO ₂	(0-20 mole %)
	Al ₂ O ₃	(0-5 mole %)
	B ₂ O ₃	(0-5 mole %)
	WO ₃	(0-5 mole %)
	Bi ₂ O ₃	(0-5 mole %).

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9. The glass package of Claim 1, wherein said frit excluding the CTE lowering filler has the following composition:

5 K₂O (0-10 mole %)
 Fe₂O₃ (0-20 mole %)
 Sb₂O₃ (0-20 mole %)
 ZnO (0-20 mole %)
 P₂O₅ (20-40 mole %)
 V₂O₅ (30-60 mole %)
10 TiO₂ (0-20 mole %)
 Al₂O₃ (0-5 mole %)
 B₂O₃ 0-5 mole %)
 WO₃ (0-5 mole %)
 Bi₂O₃ (0-5 mole %).

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10. The glass package of Claim 1, wherein said frit is selected from one of the frits listed in TABLES 1-5.

11. A method for manufacturing a hermetically sealed
20 glass package, said method comprising the steps of:

 providing a first glass plate;
 providing a second glass plate;

 depositing a frit made from glass doped with at least
one transition metal and a coefficient of thermal expansion
25 (CTE) lowering filler onto said second glass plate; and

 heating said frit in a manner that would cause said
frit to soften and form a hermetic seal which connects said
first glass plate to said second glass plate.

12. The method of Claim 11, further comprising the step of placing an adhesive within a gap located between outer edges of said first and second glass plates, wherein
5 said gap is caused by the presence of the hermetic seal.

13. The method of Claim 11, further comprising the step of pre-sintering said frit to said second glass plate before said heating step.

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14. The method of Claim 11, wherein said heating step further includes using a laser to emit a laser beam that heats said frit.

15 15. The method of Claim 14, wherein said frit has an enhanced absorption property within an infrared region and said laser beam has a wavelength in the infrared region such that when said laser beam interacts with said frit substantially more heat energy is absorbed by said frit
20 from said laser beam when compared to the heat energy absorbed by each of said first and second glass plates.

16. The method of Claim 11, wherein said heating step further includes using an infrared lamp to emit a light
25 that heats said frit.

17. The method of Claim 16, wherein said frit has an enhanced absorption property within an infrared region and

said light has a wavelength in the infrared region such that when said light interacts with said frit substantially more heat energy is absorbed by said frit from said light when compared the heat energy absorbed by each of said
5 first and second substrate plates.

18. The method of Claim 11, wherein said frit has a softening temperature that is lower than softening temperatures of said first and second glass plates.

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19. The method of Claim 11, wherein said frit has a CTE that substantially matches the CTEs of said first and second glass plates.

15 20. The method of Claim 11, wherein said filler is an inversion filler.

21. The method of Claim 11, wherein said filler is an additive filler including lithium alumino-silicate
20 compounds such as beta-eucryptite.

22. The method of Claim 11, wherein said frit is a low temperature glass frit containing one or more absorbing ions chosen from the group including iron, copper,
25 vanadium, and neodymium.

23. The method of Claim 11, wherein said frit excluding the CTE lowering filler has the following composition:

5 K₂O (0-10 mole %)
 Fe₂O₃ (0-20 mole %)
 Sb₂O₃ (0-40 mole %)
 P₂O₅ (20-40 mole %)
 V₂O₅ (30-60 mole %)
 TiO₂ (0-20 mole %)
10 Al₂O₃ (0-5 mole %)
 B₂O₃ (0-5 mole %)
 WO₃ (0-5 mole %)
 Bi₂O₃ (0-5 mole %).

15 24. The method of Claim 11, wherein said frit excluding the CTE lowering filler has the following composition:

 K₂O (0-10 mole %)
 Fe₂O₃ (0-20 mole %)
20 Sb₂O₃ (0-20 mole %)
 ZnO (0-20 mole %)
 P₂O₅ (20-40 mole %)
 V₂O₅ (30-60 mole %)
 TiO₂ (0-20 mole %)
25 Al₂O₃ (0-5 mole %)
 B₂O₃ (0-5 mole %)
 WO₃ (0-5 mole %)
 Bi₂O₃ (0-5 mole %).

25. The method of Claim 11, wherein said frit is selected from one of the frits listed in TABLES 1-5.

5 26. An organic light emitting diode device having at least one organic light emitting diode located between two plates connected to one another by a hermetic seal formed from a frit that was heated by an irradiation source in a manner that caused said frit to melt and form the hermetic
10 seal while at the same time avoiding thermal degradation of said at least one organic light emitting diode, wherein said frit is a glass that was doped with at least one transition metal and a coefficient of thermal expansion (CTE) lowering filler.

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 27. The organic light emitting diode device of Claim 26, wherein said two plates are two glass plates each of which absorbs less heat energy from said heating mechanism when compared to the heat energy absorbed by said frit from
20 said irradiation source.

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 28. The organic light emitting diode device of Claim 26, wherein said irradiation source is a laser or an infrared lamp.

29. The organic light emitting diode device of Claim 26, wherein said filler is an inversion filler or an additive filler.

5 30. The organic light emitting diode device of Claim 26, wherein said organic light emitting diode device is a display.

31. An organic light emitting diode display
10 comprising:

 a first substrate plate;
 at least one organic light emitting diode;
 a second substrate plate; and

 a frit made from glass that was doped with at least
15 one transition metal and a coefficient of thermal expansion (CTE) lowering filler, wherein said frit was heated by an irradiation source in a manner that caused said frit to soften and form a hermetic seal which connects said first substrate plate to said second substrate plate and also
20 protects said at least one organic light emitting diode located between said first substrate plate and said second substrate plate.

32. The organic light emitting diode device of Claim
25 31, wherein each of said first and second substrate plates is a glass plate that absorbs less heat energy from said irradiation source when compared to heat energy absorbed by said frit from said irradiation source.

33. The organic light emitting diode device of Claim 31, wherein said filler is an inversion filler or an additive filler including lithium alumino-silicate compounds such as beta-eucryptite.

34. The organic light emitting diode device of Claim 31, wherein said frit is a low temperature glass frit containing one or more absorbing ions chosen from the group including iron, copper, vanadium, and neodymium.

35. The organic light emitting diode device of Claim 31, wherein said frit excluding the CTE lowering filler has the following composition:

K₂O (0-10 mole %)
Fe₂O₃ (0-20 mole %)
Sb₂O₃ (0-40 mole %)
P₂O₅ (20-40 mole %)
V₂O₅ (30-60 mole %)
TiO₂ (0-20 mole %)
Al₂O₃ (0-5 mole %)
B₂O₃ (0-5 mole %)
WO₃ (0-5 mole %)
Bi₂O₃ (0-5 mole %).

36. The organic light emitting diode device of Claim 31, wherein said frit is selected from one of the frits listed in TABLES 1-5.

5 37. A method for manufacturing an organic light
emitting diode device, said method comprising the steps of:
 providing a first substrate plate;
 providing a second substrate plate;
 depositing a frit made from glass doped with at least
10 one transition metal and a coefficient of thermal expansion
(CTE) lowering filler onto one of said substrate plates;
 and
 depositing at least one organic light emitting diode
 onto one of said substrate plates; and
15 heating and then cooling said frit in a manner that
would cause said frit to melt and form a hermetic seal
which connects said first substrate plate to said second
substrate plate and also protects said at least one organic
light emitting diode.

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 38. The method of Claim 37, further comprising the
step of placing an adhesive within a gap located between
outer edges of said first and second substrate plates,
wherein said gap is caused by the presence of the hermetic
25 seal.

39. The method of Claim 37, further comprising the step of pre-sintering said frit to said one of the substrate plates before said heating step.

5 40. The method of Claim 37, wherein said heating step is performed at a temperature which causes said frit to melt and form the hermetic seal while at the same time avoiding damage to said at least one organic light emitting diode.

10 41. The method of Claim 37, wherein said heating step further includes using a laser to emit a laser beam that heats said frit.

15 42. The method of Claim 41, wherein said frit has an enhanced absorption property within an infrared region and said laser beam has a wavelength in the infrared region such that when said laser beam interacts with said frit substantially more heat energy is absorbed by said frit
20 from said laser beam when compared to the heat energy absorbed by each of said first and second substrate plates.

25 43. The method of Claim 37, wherein said heating step further includes using an infrared lamp to emit a light that heats said frit.

44. The method of Claim 43, wherein said frit has an enhanced absorption property within an infrared region and

said light has a wavelength in the infrared region such that when said light interacts with said frit substantially more heat energy is absorbed by said frit from said light when compared the heat energy absorbed by each of said
5 first and second substrate plates.

45. The method of Claim 37, wherein said frit has a softening temperature that is lower than softening temperatures of said first and second substrate plates.

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46. The method of Claim 37, wherein said frit has a CTE that substantially matches the CTEs of said first and second substrate plates.

15 47. The method of Claim 37, wherein said filler is an inversion filler or an additive filler.

48. The method of Claim 37, wherein said frit is a low temperature glass frit containing one or more absorbing
20 ions chosen from the group including iron, copper, vanadium, and neodymium.

49. The method of Claim 37, wherein said frit excluding the CTE lowering filler has the following
25 composition:

K₂O (0-10 mole %)
Fe₂O₃ (0-20 mole %)
Sb₂O₃ (0-40 mole %)

5 P₂O₅ (20-40 mole %)
 V₂O₅ (30-60 mole %)
 TiO₂ (0-20 mole %)
 Al₂O₃ (0-5 mole %)
 B₂O₃ (0-5 mole %)
 WO₃ (0-5 mole %)
 Bi₂O₃ (0-5 mole %).

10 50. The method of Claim 37, wherein said frit is
 selected from one of the frits listed in TABLES 1-5.

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